

Under Treating Polymicrobial Infection in Crohn's Disease

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Summary

Crohn's disease is said to be a disease entity without cure. The current antibiotic standard of care for the polymicrobial infection created by submucosal penetration by the gastrointestinal microbiota is discussed. Submucosal fibrosis, strictures, intra-mural abscess formation, and loop-to-loop fistula are stigmata of failure to treat of the respective segments of anaerobic progression within its polymicrobial infection. In Crohn's disease, the polymicrobial infection secondary to the loss of mucosal integrity requires comprehensive antibiotic therapy that spans the constituencies of the anaerobic progression.

Since the trial-and-error demonstration that interference with host immunity beneficially affected symptomatology and ultimately mucosal healing, the focus of research on Crohn's disease has been, not on seeking a cure, but on finding a more precise delineation of the underlying pro-inflammatory response. The abandonment of causation for palliative medicine is a failure of leadership that has had human consequences.

In 2015, the Hruska Postulate described the mechanism by which human infection by MAP could transform itself into an immune mediated disease and how immune-destructive disease engenders a second infectious disease process [1-3].

The potential for the future development of Crohn's disease is created when *Mycobacterium avium* subspecies *paratuberculosis* (MAP) infection occurs in the relative absence of acquired immunity [2]. The timing of MAP infection and the amount of the infectious challenge can result in the pro-inflammatory cytokine response to MAP becoming fixed within immunological memory. By so doing, an infectious disease due to MAP self-converts into an immune-mediated process [3].

To achieve disease status, repeated exposures to live or killed MAP ultimately overwhelm the regenerative capacity of the ileocecal mucosa. The loss of mucosal integrity brings into play a second disease-producing process: invasion of the lamina propria and submucosa by gastrointestinal microbiota. This polymicrobial infection follows the dictates of the anaerobic progression [4,5].

With an open portal to the microbiological flora of the female genital tract, *Neisseria gonorrhoeae* infection readily converts mono-etiological infection into polymicrobial disease [5,6]. In acute salpingitis, eradication of the anaerobic progression required lockdown of both of its facultative and obligatory anaerobic constituencies in order to avoid irreparable alterations to fallopian tube structure and function that result in ectopic pregnancies, secondary infertility and creation of tubo-ovarian abscesses [6].

Cytokine immune destruction of MAP at its points of dense attachment within the ileocecal region and at MAP's sites of antigen processing creates an open portal for the microbiota of the gastrointestinal tract as well as alters the local microbiological environment so as to set into motion the anaerobic progression.

The consequences of prior ineffective antimicrobial therapy for Crohn's disease are readily in evidence. Submucosa fibrosis and stricture are the consequences of under-treatment of the facultative anaerobic portion (particularly the *Enterobacteriaceae*). Intramural abscess formation, loop-to-loop fistulae, and septic deaths reflect the dominance of obligatory anaerobic bacteria. Abscesses and fistula occur in an estimated one quarter of individuals afflicted with Crohn's disease.

The interval between the onset of signs and symptoms of disease/inflammation and the administration of antibiotic therapy is of importance. Delay of proper antibiotic therapy to attain greater diagnostic certainty provides more time in which the anaerobic progression can advance. With testing for protozoan, enterotoxin, mycobacteria, and bacterial causes of chronic diarrhea pending and medical evidence of a disease process compatible with that of Crohn's disease, aggressive lock-down antibiotic therapy of the anaerobic progression is merited.

The Hippocratic Oath asks physicians that, in trying to do good, not to do evil. Subluminal fibrosis, strictures, bowel perforations, loop-to-loop fistulae, and septic deaths due to under-addressed infection do not speak to good.

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